



EMISSION STUDY

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Product: HPC-H01/H05
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Scope:

To determine the emissivity of HPC's H-Series coatings as compared to other materials.

General:

The emissivity of an object is a ratio of the reflected vs. absorbed energy at the same temperature. A true blackbody has an emissivity of 1.00, so a ratio that is closer to 1.00 would indicate that the object is closer to being a blackbody and would retain the heat or energy that the object contains. **For applications that require heat energy to be maintained inside the diameter of the object (i.e. exhaust pipes) or outside (i.e. cold air charge tubes), it is important to have a coating that has a low emissivity number provided by the matrix of the coating. To further reduce emissivity from a component, it is recommended that both sides of the substrate be coated.** The color is not of importance because it has little effect on the emissivity of the coating. The matrix of the coating and how the molecules are aligned is of importance.

HPC's H01 and H05 will retain up to 80% of the thermal energy inside the component, giving a lower air density throughout the pipe and resulting in higher flow velocity. This correlates with the added horsepower that can be achieved and adds even more benefit than just the appearance characteristics of the coating.

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Emissivity Study

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The following table shows various values for emissivity for comparison puposes.

Material	Temperature °F (°C)	ϵ-Emissivity
HPC H05	206 (96.7)	.16
HPC H05	460 (238)	.21
Cold Rolled Steel	200 (93)	.75-.85
301 Stainless polished	450 (232)	.57
316 Stainless polished	450 (232)	.57
321 Stainless	200-800 (93-427)	.27-.32
Ceramic-White Al ₂ O ₃	200 (93)	.90
Ceramic-Porcelain	72 (22)	.92
Ceramic-Zirconia on Inconel	800-2000 (427-1093)	.62-.45
Lacquer-Black	200 (93)	.96

Table 1: Emissivity values from Transactions in Measurement and Control, Omega, Vol. 1, 2nd Edition, 1998, pgs. 72-76.

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